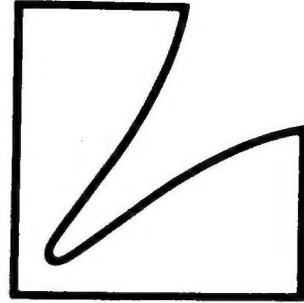
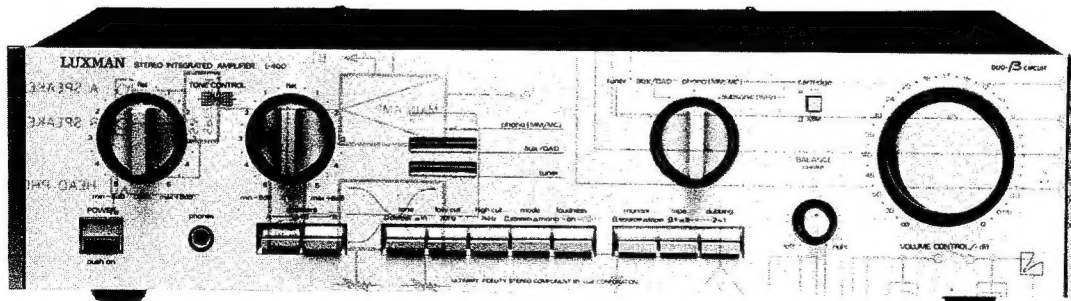


# SERVICE MANUAL



DUO-BETA CIRCUIT STEREO  
INTEGRATED AMPLIFIER

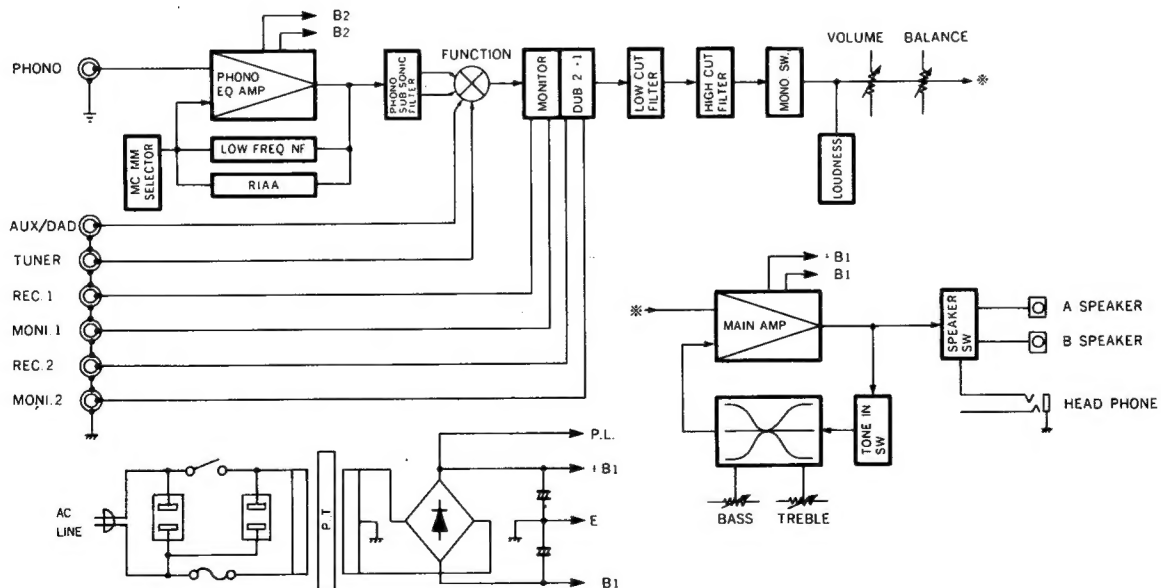
# L-400



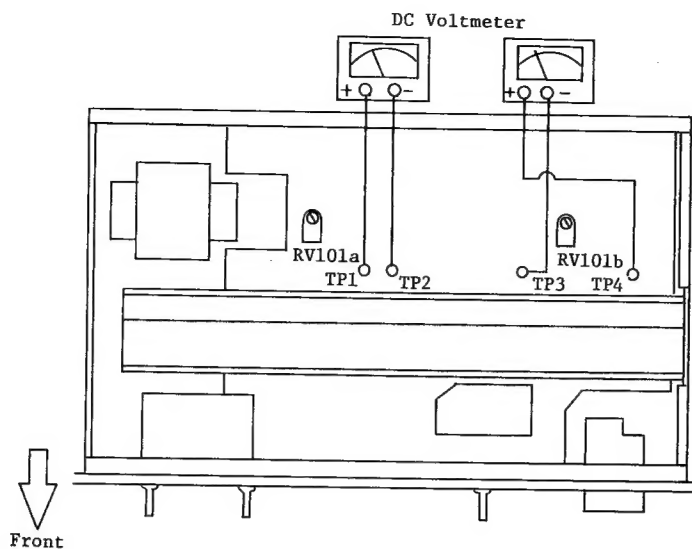
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## Block Diagram



# Adjustment Procedures

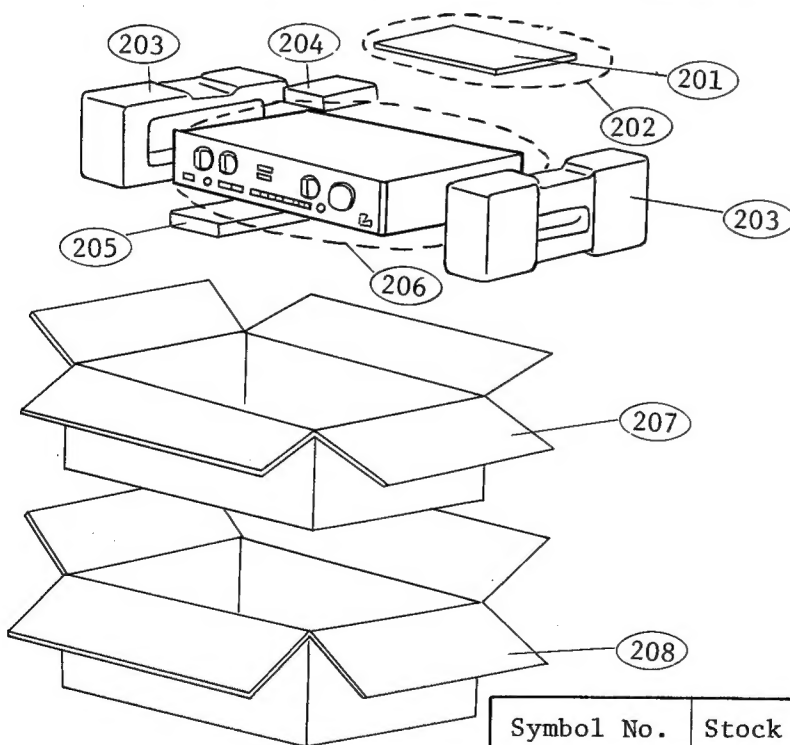


L-400

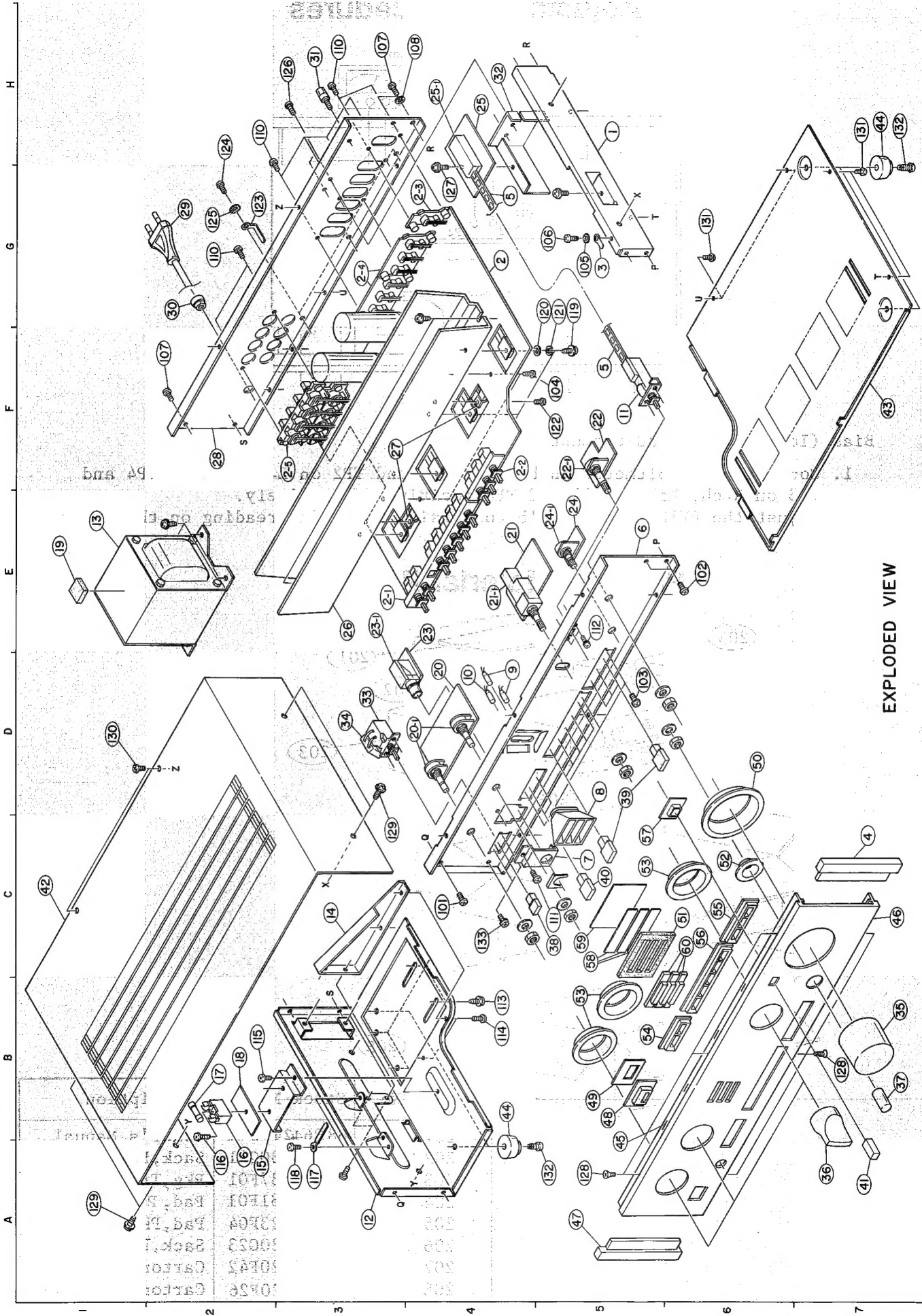
## Bias (Idle) Current Adjustment

1. Connect a DC Voltmeter in between TP1 and TP2 on L-ch and or TP4 and TP3 on R-ch, Making TP1 and TP4 positive respectively.
2. Adjust the RV101a and RV101b to obtain  $15\text{mV} \pm 5\text{mV}$  reading on the meter.

## Packing Material Parts List



Symbol No.	Stock No.	Description
201	68R64248 F01	Owner's Manual
202	56B40230G21	Sack, Poly
203	56C56637F01	Pkg, Tray
204	56A58581F01	Pad, Pkg
205	56A57423F04	Pad, Pkg
206	56B40230G23	Sack, Poly
207	56C53420F42	Carton, Pkg
208	56C53420F26	Carton, Bulk Pkg



EXPLODED VIEW

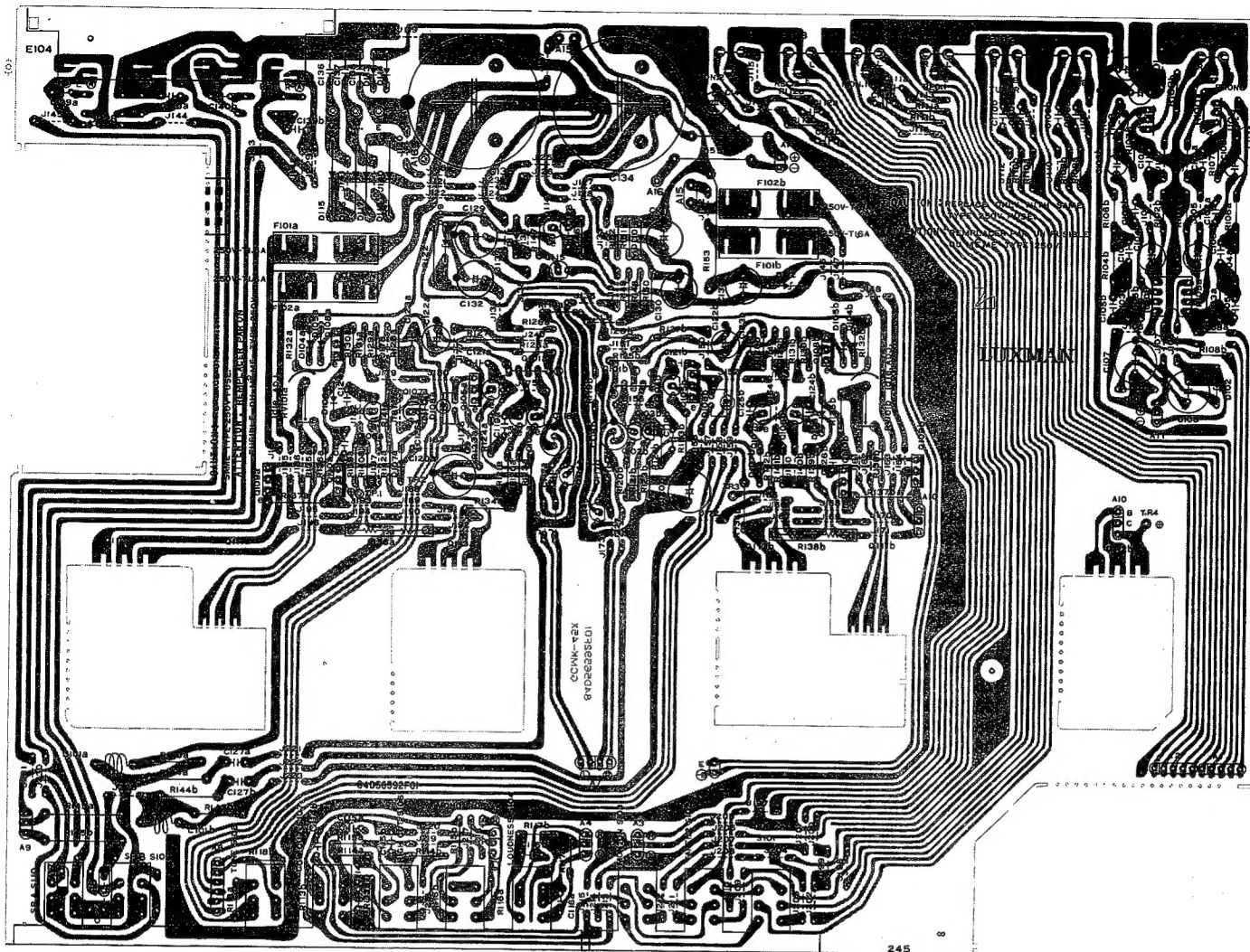
# Exploded View Parts List

Index	Symbol No.	Stock No.	Description
H-5	1	07B56633F01	Bkt,R
G-4	2	01V58700F23	Ass'y,Par M/A PCB
E-3	2-1	40T56667F01	SW,Push SUN73 (SW104-110)
F-4	2-2	40T56653F01	SW,Push SUN33 (SW101-103)
G-4	2-3	09T57203F01	Plate,Phone 2P (E101)
G-3	2-4	09T57203F02	Plate,Phone 6P (E102,103)
F-3	2-5	09T51101F01	Terminal,SP (E104)
G-5	3	29A41814G01	Lug
C-7	4	07B56624F01	Frame,Panel Side-R
G-4/F-5	5	45T57373F01	Wire,Flex SWR1198 (S701)
E-5	6	27C56631F01	Chassis,Front
C-5	7	07A57048F01	Bkt,Phones
D-5	8	43A56651F01	Bushing,Rubber
		91A57951F01	Filter,1035
D-4	9	65T56669F01	Lamp,Pilot (AUX,Tuner)
D-4	10	65T56669F02	Lamp,Pilot Grn (Phono)
F-5	11	40T57371F01	SW,Push SUFR1 (S701)
A-3	12	07C56632F01	Bkt,Trans
E-1	13	25T56591F01	Trans,Power
C-3	14	07B57267F01	Bkt,Trans
A-2	15	07A56634F01	Bkt,Fuse
A-2	16		Holder,Fuse
		09T51828F01	Holder,Fuse
B-2	17	65T52486F12	Fuse,Semko
B-2	18	43A51798F02	Spacer,Fuse
E-1	19	75A50578F07	Pad,Cushion
D-4	20	01V58100F06	Ass'y,Tone Cont.PCB
D-4	20-1	18T56663F01	VR,Rotary 50KCx2 (RV201,203)
E-4	21	01V58100F95	Ass'y,Function SW PCB
E-4	21-1	40T56664F01	SW,Rotary SRZ (S301)
F-5	22	01V58100F08	Ass'y,VR Cont.PCB
F-5	22-1	18T56666F01	VR,Rotary 250KW (RV601)
E-4	23	01V58100F09	Ass'y,HD Phone PCB
E-3	23-1	09T56010F01	Jack,HD Phone M-1669 (HD)
E-5	24	01V58100F10	Ass'y,Blance Cont.PCB
E-5	24-1	18T56665F01	VR,Rotary 100KBx2 (RV401)
H-4	25	01V58600F50	Ass'y,MC SW PCB
H-4	25-1	40T57372F01	SW,Slide SSR4235 (S-701)
E-3	26	07C56668F01	Heat Sink
F-3	27	07R51146F01	Support,TR
F-2	28	15C56636F09	Cover,Rear
G-2	29	28T55335F01	Plus,AC Cord
G-2	30	43B41625J02	Support,Cord
H-3	31	09T51075F01	Terminal,GND
H-4	32	07A57406F01	Bkt,PCB
D-3	33	40T57580F01	SW,Power
D-3	34	08T57437F09	Cap,MP 0.01
B-7	35	36B56627F01	Knob,Rotary VR C
A-7	36	36B56626F01	Knob,Rotary VR B
B-7	37	36A56625F01	Knob,Rotary VR A
C-5	38	36A56639F02	Knob,Push 1171
D-5	39	36A56640F01	Knob,Push 1189
C-5	40	36A56640F01	Knob,Push 1189
A-7	41	36A57180F01	Knob,Push B
C-1	42	15C56629F01	Cover,Top
F-7	43	15C56630F01	Cover,Bottom
H-7/B-4	44	75A52969F01	Pad,Trannleg
A-5	45	14S53018F42	Insulator,50x5
C-7	46	64C56623F05	Panel,Front
A-5	47	07B56624F02	Frame,Panel Side
B-5	48	61A56641F01	Crystal,Indicator
B-5	49	43A56628F01	Spacer,Power
D-6	50	07B56643F01	Frame,Knob 1140
C-6	51	43A56644F01	Spacer,Frame Knob

L-400

Index	Symbol No.	Stock No.	Description
C-6	52	07A56645F01	Frame,Knob 1156
C-5/B-5	53	07A56648F01	Frame,Knob
B-5	54	07C56907F01	Frame,Knob 1153
C-6	55	07B56646F01	Frame,Knob 1154
C-5	56	07C56647F01	Frame,Knob 1155
C-5	57	07A57407F01	Frame,Knob 1163
C-5	58	61A56649F01	Filter,Lamp
C-5	59	43A56650F01	Spacer,Lamp
C-5	60	61A56642F01	Crystal,Indicator
C-4	101	03S44205G01	Scr,T-Tite M3x6
E-6	102	03S44205G01	Scr,T-Tite M3x6
D-5	103	03C40014G04	Scr,Mch.M3x6
F-5	104	03S40036U02	Scr,T-Tite M3x8
G-5	105	04S40072G16	Wsr, T.L.M3
G-5	106	03C42723U01	Scr,Cup.M3x6
H-3/F-2	107	03S44205G02	Scr,T-Tite M3x6
H-4	108	04S40072G16	Wsr, T.L.M3
F-2	109	03S44205G51	Scr,T-Tite M4x8
H-2/G-2	110	03S40012G41	Scr,Tpg.M3x8
C-5	111	03S44205G01	Scr,T-Tite M3x6
E-5	112	03C40014G04	Scr,Mch.M3x6
B-4	113	03S40036U01	Scr,T-Tite M4x8
B-4	114	03S44205G01	Scr,T-Tite M3x6
B-2	115	03S44205G01	Scr,T-Tite M3x6
A-2	116	03S44205G03	Scr,T-Tite M3x8
A-3	117	29C41045P03	Lug,W.Around
A-3	118	03S44205G01	Scr,T-Tite M3x6
G-5	119	03S40011G32	Scr,Mch M3x12
G-5	120	04S40070G05	Wsr, 3.3x8x0.5
G-5	121	04S40071G01	Wsr, 3.1x5.9x0.7
F-5	122	03S40012G28	Scr,Tpg.M3x8
G-2	123	29A737272-A	Lug,W.Around
H-2	124	03S44205G01	Scr,T-Tite M3x6
G-2	125	04S40072G16	Wsr,T.L. M3
H-3	126	03S44205G02	Scr,T-Tite M3x6
G-4	127	03C42723U01	Scr,T-Tite M3x6
B-7/A-5	128	03S44205G16	Scr,T-Tite M3x6
A-1/E-3	129	03S40036U01	Scr,T-Tite M4x8
D-1	130	03S44205G38	Scr,T-Tite M3x6
G-6/H-7	131	03S44205G02	Scr,T-Tite M3x6
A-5/H-7	132	03S44205G25	Scr,T-Tite M4x10
C-4	133	03C40014G04	Scr,M3x6
AC OUTLET			
	***	09T57066F01	Outlet,AC S2-724B-04

# Pre-Main AMP PCB Parts List



L-400

Symbol No.	Stock No.	Description
(Switch)		
SW101-103	40T56653F01	SUN33
SW104-110	40T56667F01	SUN73
(Terminal)		
E101	09T57203F01	Plate, Phone 2P
E102	09T57203F02	Plate, Phone 6P
E103	09T57203F02	Plate, Phone 6P
E104	09T51101F01	Terminal SP
(IC)		
IC101	51T52153F01	NJM2043D-D
(Transistor & FET)		
Q101a,b	48T53430F01	2SA979G
Q102a,b	48S43525F02	2SC1815Y
Q103a,b	48S43525F02	2SC1815Y
Q104a,b	48S43525F02	2SC1815Y
Q105a,b	48T56658F01	2SC1904B,V
Q106a,b	48S43525F02	2SC1815Y
Q107a,b	48T51118F01	2SA1015Y
Q108a,b	48T56657F01	2SA899B,V
Q109a,b	48T56660F03	2SC2824 OY
Q110a,b	48T56659F03	2SA1184 OY
Q111a,b	48T47682F02	2SC1845FA
Q112a,b	48T57132F03	2SC3181 OR
Q113a,b	48T57131F03	2SA1264 OR
Q114a,b	48T51539F01	2SK117Y,FET
Q114	48T47682F02	2SC1845FA
Q115	48S43525F02	2SC1815Y

Symbol No.	Stock No.	Description
(Variable Resistor)		
RV101a,b	18C42061J28	470-B
(Coil)		
L101a,b	24T51105F02	Choke
(Fuse)		
F101a,b	65T57086F09	3A 250V
F102a,b	65T57086F09	3A 250V
(Holder, Fuse)		
F101a,b	09T51410F01	Holder
F102a,b	09T51410F01	Holder
(Diode)		
D101	48T52741F54	HZ18-3L Zener
D102	48T52741F54	HZ18-3L Zener
D104a,b	48T51117F01	1S1553
D105a,b	48T51117F01	1S1553
D106a,b	48T51117F01	1S1553
D107a,b	48T51117F01	1S1553
D108a,b	48T40955T01	TLR124 Red LED
D109	48T52741F62	HZ24-2L Zener
D110	48T51117F01	1S1553
D111	48T44992F01	D135D
D112	48T52741F59	HZ22-2L Zener
D113	48T44992F01	DS135D
D114	48T44992F01	DS135D
D115	48T51115F02	S3V20

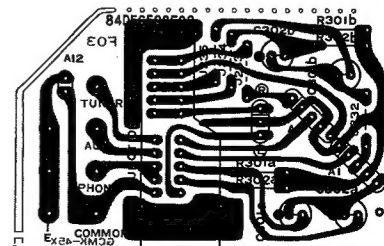


Symbol No.	Stock No. L-400	Description
D116	48T51115F02	S3V20
D117	48T51115F02	S3V20
D118	48T51115F02	S3V20
(Capacitor)		
C101a,b	08T42081U01	150pF 125V Po
C103a,b	23T00030L38	0.0022uF Ce
C104a,b	23T44501P27	47uF 16V E1
C105a,b	08S40656F22	47uF 25V E1
C106a,b	08S40656F15	0.047uF Ce
C107	23T00029F54	0.056yF My
C108	23T00029F54	0.015uF My
C113a,b	23T43197F17	220uF 25V E1
C114a,b	08S40656F22	220uF 25V E1
C115a,b	08S41442F10	4.7uF 50V E1
C116a,b	08S41442F21	0.056uF My
C117a,b	08C42195G20	0.0056uF My
C118a,b	23T44501P08	0.047uF My
C119a,b	08S41442F06	47pF 125V St
C120a,b	23S41198U38	3.3uF 25V Ce
C121a,b	08C42195G15	0.0027uF My
C122a,b	23T00030L43	100uF 63V E1
C123a,b	08T55119F03	33pF 125V St
C124a,b	08S41442F05	100uF 10V E1
C125a,b	08S41442F05	3pF 50V Mi
C126a,b	08S40656F01	0.0022uF My
C127a,b	08S41442F21	0.0022uF My
C128	08S40656F01	0.001uF My
C129	23S41198U38	0.047uF My
C130	23T00030L41	0.001uF My
C131	23T00030L28	100uF 63V E1
C132	23T00030L39	47uF 50V E1
C133	23T00030L40	47uF 25V E1
C134	23T56654F01	47uF 35V E1
C135	23T56654F01	10000uF 50V E1
C141	23T50030F16	10uF 16V E1
C142	23T50030F16	10uF 16V E1
C143	23T50030F16	10uF 16V E1
(Resistor)		
R100a,b	06S44593P43	120 1/4W Rd
R102a,b	06S44594P24	270K 1/4W Rd
R103a,b	06S44594P08	56K 1/4W Rd

Symbol No.	Stock No. L-400	Description
R104a,b	06S44593P81	4.7K 1/4W Rd
R105a,b	06S44594P38	1M 1/4W Rd
R106a,b	06S44593P29	33 1/4W Rd
R107a,b	06S44593P37	68 1/4W Rd
R108a,b	06S44593P57	470 1/4W Rd
R109a,b	06S44594P38	1M 1/4W Rd
R110a,b	06S44594P38	1M 1/4W Rd
R111a,b	06S44594P38	1M 1/4W Rd
R112a,b	06S44594P38	1M 1/4W Rd
R113a,b	06S44594P38	1M 1/4W Rd
R114a,b	06S44594P38	1M 1/4W Rd
R115a,b	06S44593P75	2.7K 1/4W Rd
R116a,b	06S44593P75	2.7K 1/4W Rd
R117a,b	06S44593P89	10K 1/4W Rd
R118a	06S40151T36	820K 1/4W Rd
R118b	06S44594P36	820K 1/4W Rd
R119a,b	06S44594P36	820K 1/4W Rd
R120a,b	06S44593P49	220 1/4W Rd
R121a,b	06S44593P49	220 1/4W Rd
R122	06T55177F73	2.2K 1W Rm
R123a,b	06S44594P22	220K 1/4W Rd
R124a,b	06S44593P53	330 1/4W Rd
R125a,b	06S44594P08	56K 1/4W Rd
R126a,b	06S44593P87	8.2K 1/4W Rd
R127a,b	06S44593P57	470 1/4W Rd
R128a,b	06S44593P87	8.2K 1/4W Rd
R129a,b	06S44594P06	47K 1/4W Rd
R130a,b	06S44593P99	27K 1/4W Rd
R131a,b	06S44593P99	27K 1/4W Rd
R132a,b	06T55175F47	180 1/2W Rm
R133a,b	06T55175F17	10 1/2W Rm
R134a,b	06T55175F07	3.9 1/2W Rm
R135a,b	06S44593P73	2.2K 1/4W Rd
R136a,b	06S44593P61	680 1/4W Rd
R137a,b	06T55177F55	390 1W Rm
R138a,b	06T51107F01	0.22x2 5W Rc
R139a,b	06S44593P69	1.5K 1/4W Rd
R140a,b	06S44593P73	2.2K 1/4W Rd
R141a,b	06S44593P73	2.2K 1/4W Rd
R142a,b	06S44593P69	1.5K 1/4W Rd
R143a,b	06T55175F17	10 1/2W Rm
R144a,b	06T55177F17	10 1W Rm
R145a,b	06T55179F57	470 2W Rm
R146	06S44593P85	6.8K 1/4W Rd
R147	06S44593P33	47 1/4W Rd
R148	06S44594P18	150K 1/4W Rd
R149	06S44594P18	150K 1/4W Rd
R150	06S44594P06	47K 1/4W Rd
R151	06S44594P08	56K 1/4W Rd
R153	06T56661F51	270 3W Rm
R154	06T55179F73	2.2K 2W Rm
R155	06T55179F73	2.2K 2W Rm
R160a,b		150 1/4W Rd
R161a,b		150 1/4W Rd
R162a,b		150 1/4W Rd
R163a,b		15 1/4W Rd

## Function SW PCB Parts List

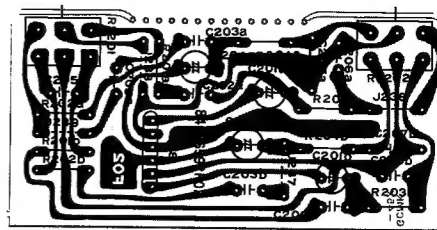
Symbol No.	Stock No. L-400	Description
(Switch)		
S301	40T56664F01	Rotary,SRZ
(Capacitor)		
C301a,b	23T44501P06	2.2uF LR 35V E1
C302a,b	23T44501P03	0.33uF LR 50V E1
(Resistor)		
R301a,b	06S44594P30	470K 1/4W Rd
R302a,b	06S44594P30	470K 1/4W Rd





## Tone Control PCB Parts List

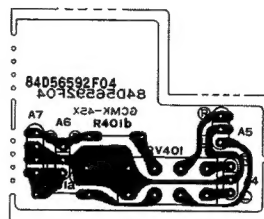
Symbol No.	Stock No.	Description
(VR Rotary)		
RV201	18T56663F01	50KCx2
RV202	18T56663F01	50KCx2
(Capacitor)		
C201a,b	23T00030L11	4.7uF 25V E1
C202a,b	08S40656F11	0.0068uF My
C203a,b	08S40656F20	0.039uF My
C204a,b	23T00030L24	22uF 16V E1
C205a,b	21S40655F31	560pF Ce
C206a,b	08S40656F22	0.056uF My
C207a,b	08S44503P30	0.27uF 50V My
(Resistor)		
R201a,b	06S44593P71	1.8K 1/4W Rd
R202a,b	06S44593P53	330 1/4W Rd
R203a,b	06S44593P87	8.2K 1/4W Rd
R204a,b	06S44593P69	1.5K 1/4W Rd



L-400

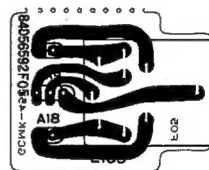
## VR Control PCB Parts List

Symbol No.	Stock No.	Description
(VR, Rotary)		
RV401	18T56665F01	100KBx2
(Resistor)		
R401a,b	06S44593P57	470 1/4W Rd



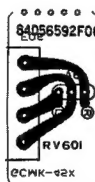
## HD Phone PCB Parts List

Symbol No.	Stock No.	Description
(Jack)		
E105(HP)	09T56010F01	HD Phone M1669



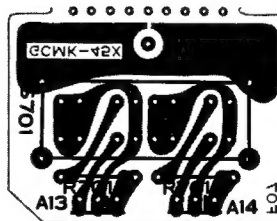
## Balance Control PCB Parts List

Symbol No.	Stock No.	Description
(VR, Rotary)		
RV601	18T56666F01	250KW



## MC SW PCB Parts List

Symbol No.	Stock No.	Description
(Switch)		
S701	40T57372F01	Slide SSR2435
(Resistor)		
R701a,b	06S44593P21	15 1/4W Rd



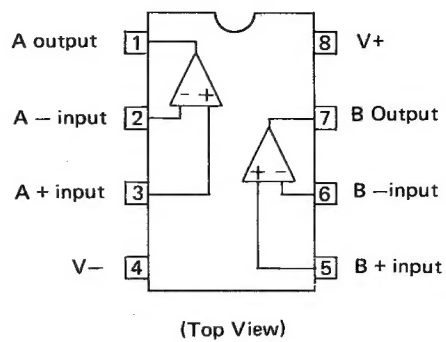
### Remarks

Capacitor : El...Electrolytic, Ce...Ceramic, P ...Polyethylene, My...Mylar.

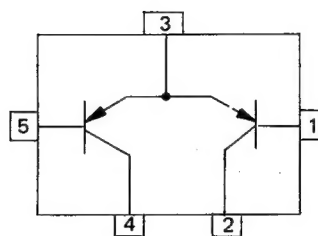
Resistor : Rd...Carbon, Rm...Metal Film, Rc...Cement.

# IC Handling Guide

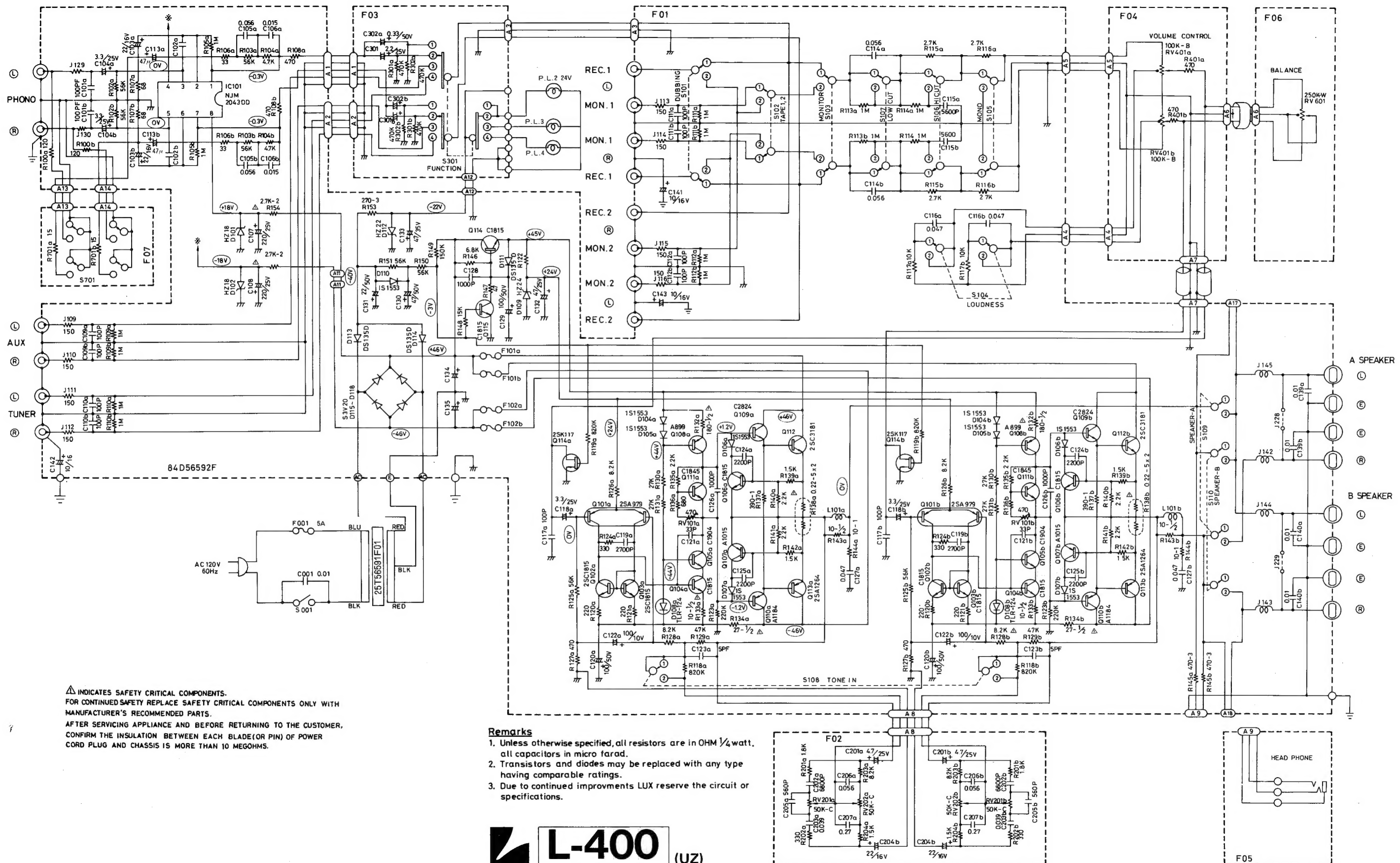
NJM2043D-D  
IC101  
(Stock No. 51T52153F01)



TR, 2SA979G  
Q101a,b  
(Stock No. 48T53430F01)



# Schematic Diagram



# Specifications

Power Output:	55W/Channel
8 ohm, 20~20,000Hz	
Distortion:	0.02%
Input Sensitivity:	
Phono (MM)	1.8mV
Phono MC	0.3mV
Tuner	160mV
Aux/DAD	160mV
Monitor	160mV
Input Impedance:	
Phono (MM)	50K ohms
Phono MC	100 ohms
Tuner	40K ohms
Aux/DAD	40K ohms
Monitor	40K ohms
S/N Ratio:	
Phono (MM)	90dB
(IHF-A weighted, 5mV)	
Phono MC	67dB
(IHF-A weighted)	
Tuner	107dB
(IHF-A weighted)	
Aux/DAD	107dB
(IHF-A weighted)	
Residual Noise:	0.5mV
Filter:	
High Cut	7KHz (-6dB/oct)
Low Cut	70Hz (-6dB/oct)
Phono Subsonic	15Hz (-6dB/oct)
Phono (MM) Overload:	130mV
Frequency Respons:	
Phono (MM)	20Hz-20KHz (within $\pm 0.5$ dB)
Tuner	10Hz-100KHz (within $\pm 0, -1.5$ dB)
Aux/DAD	10Hz-100KHz (within $\pm 0, -1.5$ dB)
Monitor	10Hz-100KHz (within $\pm 0, -1.5$ dB)
Tone Control:	
Treble	$\pm 8$ dB at 10KHz
Bass	$\pm 8$ dB at 100Hz
Loudness:	
Volume -30dB	$\pm 8$ dB at 100Hz
Dimention:	453(W) x 317(D) x 111(H) mm
	(17.8" x 12.5" x 4.4")
Weight:	
Net	7.6Kgs
Gross	9.0Kgs
Power Consumption	120V 2.3A
	(CSA Rated)

Specifications and appearance design subject to without notice.

L-400



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